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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

| | | | |
|------------------------------|---------------------------------------|---------------------------------------|--|
| Office Action Summary | Application No. 10/663,834 | Applicant(s) HYUN, JAE-HWAN | |
| | Examiner Thomas A. Morrison | Art Unit 3653 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 February 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2-18, 20 and 23-34 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 2-18, 20 and 23-34 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Applicant's amendment dated 02/01/2007 has been entered.
2. The indicated allowability of claims 2-6 is withdrawn in view of the newly discovered reference(s) to U.S. Patent Publication No. 20020006289. Rejections based on the newly cited reference(s) follow. The examiner regrets any inconvenience that may have been caused by this new Office Action.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 2-6, 13-14 and 34 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 2 is rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. The omitted structural cooperative relationships are: (1) the structural cooperative relationship between the first, second and third levers that allows the first, second and third levers to function, as claimed. More specifically, it is unclear where the third lever is positioned relative to the image forming machine. One possible solution would be to amend claim to recite "a third lever, extending from the center and away from the first and second levers into the paper feed cassette to determine if

sheets are stacked in the paper feed cassette and [[,]] weighing more than the combined weight of the first and second levers to have a tendency to pivot downward.

Claim 13 recites "the slot". It is unclear if the recited "the slot" refers back to the previously recited "first slot" in claim 11 or the previously recited "second slot" in claim 11.

Claim 13 recites the limitation "the duplex printing path" in line 1. There is insufficient antecedent basis for this limitation in the claim. One possible solution would be to change "the duplex printing path" to -- the duplex printing paper path --.

Claim 14 recites "the slot" in line 2. It is unclear if the recited "the slot" refers back to the previously recited "first slot" in claim 11 or the previously recited "second slot" in claim 11.

Claim 14 recites the limitation "the duplex printing path" in line 2. There is insufficient antecedent basis for this limitation in the claim. One possible solution would be to change "the duplex printing path" to -- the duplex printing paper path --.

Claim 34 recites "the slot" in line 4. It is unclear if the recited "the slot" refers back to the previously recited "first slot" or the previously recited "second slot" in the previous claims from which claim 34 depends.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 2-4, 6-7 and 9-10, as best understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Publication No. 2002/0006289 in view of U.S. Patent No. 6,292,636 (Kwon).

Regarding claim 2, Fig. 1 and numbered paragraphs [0064] and [0069] of U.S. Patent Publication No. 2002/0006289 disclose a paper detecting apparatus of an image forming machine having a duplex printing function comprising:

a first sensor (126) that detects feeding of a material along a duplex printing paper path (see e.g., numbered paragraph [0069]); and

a second sensor (102) that detects the presence or absence of paper in a paper feed cassette (101)(see e.g., numbered paragraph [0064]). However, U.S. Patent Publication No. 2002/0006289 does not specifically disclose an actuator and paper sensor arrangement as claimed.

The Kwon patent discloses that it is well known to provide an actuator (Fig. 2) pivotably disposed above a paper feed cassette (including 60 and 61) and below a printing paper path (P in Fig. 3), that is moved by a paper; and

a paper sensor (10) disposed next to the actuator (Fig. 2) that senses movement of the actuator (Fig. 2) and generates a signal, wherein the actuator (Fig. 2) pivots in a

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predetermined angle when paper is being fed along the printing paper path (P in Fig. 3), and the paper sensor (10) generates a signal upon sensing the actuator (Fig. 2) pivot;

wherein the actuator (Fig. 2) comprises:

a hinge shaft (40);

a center (near 40) pivotably assembled around the hinge shaft (40);

a first lever (i.e., left-hand arm of element 30) extending from the center (near 40) that operates the paper sensor (10) when no paper is stacked in the paper feed cassette;

a second lever (i.e., right-hand arm of element 30) at a predetermined angle from the first lever (i.e., left-hand arm of element 30), that operates the paper sensor (10) when paper is fed along the printing paper path; and

a third lever (20), extending from the center (near 40) and away from the first and second levers, weighing more than the combined weight of the first and second levers to have a tendency to pivot downward.

Moreover, Kwon discloses that it is well known to perform total sensing of both paper loading and paper transporting in a cassette with only one sensor, for the purpose of reducing cost. See e.g., column 4, lines 45-50 and the Abstract. It would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute an actuator and a single sensor for the two separate sensors (126 and 102) of U.S. Patent Publication No. 2002/0006289, for the purpose of performing total sensing of both paper loading and paper transporting in a cassette with only one sensor at reduced cost, as taught by column 4, lines 45-50 and the Abstract of Kwon.

Providing an actuator and a single sensor in the environment of U.S. Patent Publication No. 2002/0006289, in a manner as taught by Kwon, will result in the actuator being positioned above the cassette and below the duplex printing paper path of U.S. Patent Publication No. 2002/0006289, because Kwon teaches positioning the actuator between a paper path and a cassette. See e.g., Fig. 3 of Kwon. With regard to the recitation "a first lever extending from the center that **operates the paper sensor when no paper is stacked in the paper feed cassette**" in claim 2, the bolded portion of this recitation is a conditional limitation that need not ever occur. Similarly, in the recitation "a second lever at a predetermined angle from the first lever, that **operates the paper sensor when paper is fed along the duplex printing paper path**" of claim 2, the bolded portion of this recitation is a conditional limitation that need not ever occur. Thus, it is the examiner's position that all of the limitations of claim 2 are met by U.S. Patent Publication No. 2002/0006289 in view of Kwon.

Regarding claim 3, Figs. 2-4 of Kwon show that the predetermined angle is determined so the second lever (i.e., right-hand arm of element 30) does not operate the paper sensor (10) when the third lever (20) is in contact with paper on the paper feed cassette (including 60 and 61).

Regarding claim 4, Fig. 4 of Kwon shows that the paper feed cassette (including 60 and 61) has a slot (61) that allows the third lever (20) to pass through.

Regarding claim 6, column 4, lines 40-45 of Kwon disclose that the paper sensor (10) is a photo sensor.

Regarding claim 7, Fig. 1 and numbered paragraphs [0064] and [0069] of U.S. Patent Publication No. 2002/0006289 disclose a paper detecting apparatus of an image forming machine, including a duplex printing paper path, comprising:

- a first paper sensor (126) with a sensing area that detects feeding of a material along a duplex printing paper path (see e.g., numbered paragraph [0069]);

- a second paper sensor (102) with a sensing area that detects the presence or absence of paper in a paper feed cassette (101)(see e.g., numbered paragraph [0064]);

However, U.S. Patent Publication No. 2002/0006289 does not specifically disclose an actuator arrangement as claimed. Also, U.S. Patent Publication No. 2002/0006289 discloses a paper pressing plate (below P in Fig. 1) of a paper feed cassette (101), but does not specifically disclose that such paper pressing plate has a slot, as claimed.

The Kwon patent discloses that it is well known to provide an actuator (Fig. 2), having a first lever (left-hand arm of element 30), a second lever (right-hand arm of element 30), a third lever (20) and a center (near 40), pivotably assembled on a hinge shaft (40);

- a paper sensor (10), having a sensing area; and

- a paper pressing plate (60) of a paper feed cassette (including 60 and 61), the paper pressing plate having a slot (61); wherein, the second lever (right-hand arm of element 30) extending from the center (near 40) and interfered by a paper when the paper moves along a printing paper path (P in Fig. 3); the first lever (left-hand arm of element 30) extending from the center (near 40) at a predetermined angle from the

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second lever (right-hand arm of element 30); and the third lever (20) extending from the center (near 40) and away from the first and second levers and heavier than the combined weight of the first and second levers, wherein the third lever (20) pivots downward to be inserted into the slot (61) so the first lever (left-hand arm of element 30) is normally located inside the sensing area of the paper sensor (10) when no paper is stacked in the paper feed cassette (including 60 and 61), and the second lever (right-hand arm of element 30) pivots into the sensing area of the paper sensor (10), and then escapes from the sensing area of the paper sensor (10) due to the weight of the third lever (20) when paper moves along the printing paper path (P in Fig. 3).

Moreover, Kwon discloses that it is well known to perform total sensing of both paper loading and paper transporting in a cassette with only one sensor, for the purpose of reducing cost. See e.g., column 4, lines 45-50 and the Abstract. It would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute an actuator and a single sensor arrangement for the two separate sensors (126 and 102) of U.S. Patent Publication No. 2002/0006289, for the purpose of performing total sensing of both paper loading and paper transporting in a cassette with only one sensor at reduced cost, as taught by column 4, lines 45-50 and the Abstract of Kwon. Providing an actuator and a single sensor arrangement including a paper pressing plate with a slot in the environment of U.S. Patent Publication No. 2002/0006289, in a manner as taught by Kwon, will result in the actuator being positioned under the duplex printing paper path and above the cassette of U.S. Patent Publication No. 2002/0006289 with a hinge shaft of the actuator located under the

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duplex paper printing path, because Kwon teaches positioning an actuator under a paper path and above a cassette with the hinge shaft located between the paper printing path and the cassette. See e.g., Fig. 3 of Kwon. With regard to the recitation "wherein the third lever pivots downward to be inserted into the slot so **the first lever is normally located inside the sensing area of the paper sensor *when no paper is stacked in the paper feed cassette***, and the second lever pivots into the sensing area of the paper sensor, and then escapes from the sensing area of the paper sensor due to the weight of the third lever *when paper moves along the duplex printing paper path*" in claim 7, the bolded portions of this recitation are conditional limitations that need not ever occur. Thus, it is the examiner's position that all of the limitations of claim 7 are met by U.S. Patent Publication No. 2002/0006289 in view of Kwon.

Regarding claim 9, Fig. 3 of Kwon shows that the second lever (right-hand arm of element 30) is not located inside the sensing area of the paper sensor (10) when the third lever (20) is in contact with paper stacked in the paper feed cassette (including 60 and 61).

Regarding claim 10, lines 40-45 of Kwon disclose that the paper sensor (10) is a photo sensor.

5. Claims 2-18, 20, and 23-34, as best understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over applicant's admitted prior art Fig. 1 and numbered paragraphs [0003] – [0020] of the instant application in view of U.S. Patent No. 6,292,636 (Kwon).

Regarding claim 2, Fig. 1 and numbered paragraphs [0003] – [0020] of the instant application disclose a paper detecting apparatus of an image forming machine having a duplex printing function comprising:

- a first sensor (20) that detects feeding of a material along a duplex printing paper path (see e.g., numbered paragraph [0006]); and

- a second sensor (10) that detects the presence or absence of paper in a paper feed cassette (30)(see e.g., numbered paragraph [0006]). However, these portions of the instant application do not specifically disclose an actuator and paper sensor arrangement as claimed.

The Kwon patent discloses that it is well known to provide an actuator (Fig. 2) pivotably disposed above a paper feed cassette (including 60 and 61) and below a printing paper path (P in Fig. 3), that is moved by a paper; and

- a paper sensor (10) disposed next to the actuator (Fig. 2) that senses movement of the actuator (Fig. 2) and generates a signal, wherein the actuator (Fig. 2) pivots in a predetermined angle when paper is being fed along the printing paper path (P in Fig. 3), and the paper sensor (10) generates a signal upon sensing the actuator (Fig. 2) pivot;

- wherein the actuator (Fig. 2) comprises:

- a hinge shaft (40);

- a center (near 40) pivotably assembled around the hinge shaft (40);

- a first lever (i.e., left-hand arm of element 30) extending from the center (near 40) that operates the paper sensor (10) when no paper is stacked in the paper feed cassette;

a second lever (i.e., right-hand arm of element 30) at a predetermined angle from the first lever (i.e., left-hand arm of element 30), that operates the paper sensor (10) when paper is fed along the printing paper path; and

a third lever (20), extending from the center (near 40) and away from the first and second levers, weighing more than the combined weight of the first and second levers to have a tendency to pivot downward.

Moreover, Kwon discloses that it is well known to perform total sensing of both paper loading and paper transporting in a cassette with only one sensor, for the purpose of reducing cost. See e.g., column 4, lines 45-50 and the Abstract. It would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute an actuator and a single sensor for the two separate sensors (20 and 10) of the apparatus in Fig. 1 of the instant application, for the purpose of performing total sensing of both paper loading and paper transporting in a cassette with only one sensor at reduced cost, as taught by column 4, lines 45-50 and the Abstract of Kwon.

Providing an actuator and a single sensor in the environment of the apparatus of Fig. 1 of the instant application, in a manner as taught by Kwon, will result in the actuator being positioned above the cassette and below the duplex printing paper path of Fig. 1 of the instant application, because Kwon teaches positioning the actuator between a paper path and a cassette. See e.g., Fig. 3 of Kwon. With regard to the recitation "a first lever extending from the center that **operates the paper sensor when no paper is stacked in the paper feed cassette**" in claim 2, the bolded portion of this recitation is a conditional limitation that need not ever occur. Similarly, in the recitation "a second

lever at a predetermined angle from the first lever, that **operates the paper sensor when paper is fed along the duplex printing paper path**" of claim 2, the bolded portion of this recitation is a conditional limitation that need not ever occur. Thus, it is the examiner's position that all of the limitations of claim 2 are met by Fig. 1 of the instant application in view of Kwon.

Regarding claim 3, Figs. 2-4 of Kwon show that the predetermined angle is determined so the second lever (i.e., right-hand arm of element 30) does not operate the paper sensor (10) when the third lever (20) is in contact with paper on the paper feed cassette (including 60 and 61).

Regarding claim 4, Fig. 4 of Kwon shows that the paper feed cassette (including 60 and 61) has a slot (61) that allows the third lever (20) to pass through.

Regarding claim 5, Fig. 1 of the instant application shows a stopper (including 42) formed on the duplex printing paper path (40) limiting pivoting space of the actuator.

Regarding claim 6, column 4, lines 40-45 of Kwon disclose that the paper sensor (10) is a photo sensor.

Regarding claim 7, Fig. 1 and numbered paragraphs [0003] – [0020] of the instant application disclose a paper detecting apparatus of an image forming machine, including a duplex printing paper path (40), comprising:

a first paper sensor (20) with a sensing area that detects feeding of a material along a duplex printing paper path (see e.g., numbered paragraph [006]);

a second paper sensor (10) with a sensing area that detects the presence or absence of paper in a paper feed cassette (30)(see e.g., numbered paragraph [006]); and

a paper pressing plate (32), the paper pressing plate (32) having a slot (34).

However, the instant application does not specifically disclose an actuator and paper sensor arrangement as claimed.

The Kwon patent discloses that it is well known to provide an actuator (Fig. 2), having a first lever (left-hand arm of element 30), a second lever (right-hand arm of element 30), a third lever (20) and a center (near 40), pivotably assembled on a hinge shaft (40); and

a paper sensor (10), having a sensing area;

wherein, the second lever (right-hand arm of element 30) extending from the center (near 40) and interfered by a paper when the paper moves along a printing paper path (P in Fig. 3); the first lever (left-hand arm of element 30) extending from the center (near 40) at a predetermined angle from the second lever (right-hand arm of element 30); and the third lever (20) extending from the center (near 40) and away from the first and second levers and heavier than the combined weight of the first and second levers, wherein the third lever (20) pivots downward to be inserted into the slot (61) so the first lever (left-hand arm of element 30) is normally located inside the sensing area of the paper sensor (10) when no paper is stacked in the paper feed cassette (including 60 and 61), and the second lever (right-hand arm of element 30) pivots into the sensing area of the paper sensor (10), and then escapes from the sensing area of the paper

sensor (10) due to the weight of the third lever (20) when paper moves along the printing paper path (P in Fig. 3).

Moreover, Kwon discloses that it is well known to perform total sensing of both paper loading and paper transporting in a cassette with only one sensor, for the purpose of reducing cost. See e.g., column 4, lines 45-50 and the Abstract. It would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute an actuator and a single sensor arrangement for the two separate sensors (20 and 10) of Fig. 1 of the instant application, for the purpose of performing total sensing of both paper loading and paper transporting in a cassette with only one sensor at reduced cost, as taught by column 4, lines 45-50 and the Abstract of Kwon.

Providing an actuator and a single sensor arrangement in the environment of Fig. 1 of the instant application, in a manner as taught by Kwon, will result in the actuator being positioned under the duplex printing paper path and above the cassette of Fig. 1 of the instant application with a hinge shaft of the actuator located under the duplex paper printing path, because Kwon teaches positioning an actuator under a paper path and above a cassette with the hinge shaft located between the paper printing path and the cassette. See e.g., Fig. 3 of Kwon. With regard to the recitation "wherein the third lever pivots downward to be inserted into the slot so **the first lever is normally located inside the sensing area of the paper sensor when no paper is stacked in the paper feed cassette**, and the second lever pivots into the sensing area of the paper sensor, and then escapes from the sensing area of the paper sensor due to the weight of the third lever *when paper moves along the duplex printing paper*

path" in claim 7, the bolded portions of this recitation are conditional limitations that need not ever occur. Thus, it is the examiner's position that all of the limitations of claim 7 are met by Fig. 1 of the instant application in view of Kwon.

Regarding claim 8, the recitation "wherein a rear end of a slot formed in the duplex printing paper path interferes with the second lever when the first lever is located inside the sensing area of the paper sensor" is a conditional limitation that need not ever occur. Thus, it is the examiner's position that all of the limitations of claim 8 are met by Fig. 1 and numbered paragraphs [0003] – [0020] of the instant application in view of Kwon.

Regarding claim 9, Fig. 3 of Kwon shows that the second lever (right-hand arm of element 30) is not located inside the sensing area of the paper sensor (10) when the third lever (20) is in contact with paper stacked in the paper feed cassette (including 60 and 61).

Regarding claim 10, lines 40-45 of Kwon disclose that the paper sensor (10) is a photo sensor.

Regarding claim 11, Fig. 1 and numbered paragraphs [0003]-[0020] of the instant application disclose a paper detecting apparatus of an image forming machine (Fig. 1), including a duplex printing paper path (40), having a first slot (42), a paper feed cassette (30) in which paper is normally stacked, a first paper sensor (20) with a sensing area that detects feeding of a material along a duplex printing paper path (see e.g., numbered paragraph [006]), and a second paper sensor (10) with a sensing area that

detects the presence or absence of paper in a paper feed cassette (30)(see e.g., numbered paragraph [006]), comprising:

a paper pressing plate (32) having a second slot (34). However, the instant application does not specifically disclose an actuator and paper sensor arrangement as claimed.

The Kwon patent discloses that it is well known to provide an actuator (Fig. 2), having a center (near 40), on a hinge shaft (40);

a first lever (left-hand arm of element 30) extending in a first direction from the center (near 40) of the actuator (Fig. 2);

a second lever (right-hand arm of element 30) extending in a second direction from the center (near 40) of the actuator (Fig. 2) such that a free end of the second lever extends into a printing paper path (P in Fig. 3); and

a third lever (20) extending in a third direction from the center (near 40) of the actuator (Fig. 2), wherein the third lever (20) is heavier than a combined weight of the first lever (left-hand arm of element 30) and the second lever (right-hand arm of element 30), is inserted into a slot (61) of a paper pressing plate (60) when no paper is stacked in a paper feed cassette (including 60 and 61), causes the actuator (Fig. 2) to pivot such that the first lever (left-hand arm of element 30) enters the sensing area of a sensor (10), is light enough so as to be moved by the impact of a paper moving along the printing paper path (P in Fig. 3) against the second lever (right-hand arm of element 30), and allows the actuator (Fig. 2) to pivot such that the second lever (right-hand arm of

element 30) enters the sensing area of the sensor (10) when the paper moves along the printing paper path.

Moreover, Kwon discloses that it is well known to perform total sensing of both paper loading and paper transporting in a cassette with only one sensor, for the purpose of reducing cost. See e.g., column 4, lines 45-50 and the Abstract. It would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute an actuator and a single sensor for the two separate sensors (20 and 10) of Fig. 1 of the instant application, for the purpose of performing total sensing of both paper loading and paper transporting in a cassette with only one sensor at reduced cost, as taught by column 4, lines 45-50 and the Abstract of Kwon. Providing an actuator and a single sensor arrangement in the environment of Fig. 1 of the instant application, in a manner as taught by Kwon, will result in the actuator being positioned in the duplex printing paper path (40) and in the cassette (30) of Fig. 1 of the instant application with the hinge shaft located under the duplex paper printing path, because Kwon teaches positioning the actuator in a paper path and in a cassette with the hinge shaft located between the paper printing path and the cassette. See e.g., Fig. 3 of Kwon. Moreover, the second free end of the second lever will extend into the first slot (42) of the duplex paper printing path (40) in Fig. 1 of the instant application, because Fig. 1 of the instant application teaches that the lever that senses paper conveyed along the duplex paper printing path (40) is positioned in the slot (42).

With regard to the recitation "**wherein the third lever is heavier than a combined weight of the first lever and the second lever, is inserted into the second slot when**

no paper is stacked in the paper feed cassette, causes the actuator to pivot such that the first lever enters the sensing area of the sensor, is light enough so as to be moved by the impact of a paper moving along the duplex printing paper path against the second lever, and **allows the actuator to pivot such that the second lever enters the sensing area of the sensor *when the paper moves along the printing paper path***" in claim 11, at least the bolded portions of this recitation are conditional limitations that need not ever occur. Thus, it is the examiner's position that all of the limitations of claim 11 are met by Fig. 1 and numbered paragraphs [0003] – [0020] of the instant application in view of Kwon.

Regarding claim 12, Fig. 2 of Kwon shows that the actuator (Fig. 2) is shaped like a letter "Y".

Regarding claim 13, Fig. 1 of the instant application shows that the slot (42) in the duplex printing path comprises a rear end.

Regarding claim 14, as best understood, Fig. 1 of the instant application shows that the slot (42) in the duplex printing path (40) has a length so the rear end of the slot acts as a stopper for the second lever to limit a pivoting space of the actuator when no paper is stacked in the paper feed cassette. Regarding the recitation "wherein the slot in the duplex printing path has a length so **the rear end of the slot acts as a stopper for the second lever to limit a pivoting space of the actuator *when no paper is stacked in the paper feed cassette***", the bolded portion of this recitation is a conditional limitation that need not ever occur. Thus, it is the examiner's position that all

of the limitations of claim 14 are met by Fig. 1 and numbered paragraphs [0003] – [0020] of the instant application in view of Kwon.

Regarding claim 15, Fig. 3 of Kwon shows that the third lever (20) maintains contact with an upper surface of paper stacked in a paper feed cassette (including 60 and 61).

Regarding claim 16, Figs. 2-4 of Kwon show that the sensor (10) is normally between the first and second levers when the paper is stacked in a paper feed cassette (including 60 and 61). Regarding the recitation “wherein the sensor is normally between the first and second levers when the paper is stacked in a paper feed cassette”, this recitation is a conditional limitation that need not ever occur. Thus, it is the examiner’s position that all of the limitations of claim 16 are met by Fig. 1 and numbered paragraphs [0003] – [0020] of the instant application in view of Kwon.

Regarding claim 17, as best understood, Fig. 3 of Kwon shows that the sensor (10) includes a limit switch (i.e., sensor 10 acts as a switch and limits the movement of the first lever). See also column 4, lines 40-41 of Kwon.

Regarding claim 18, column 4, lines 40-45 of Kwon disclose that the sensor (10) comprises a photo-sensor.

Regarding claim 20, Fig. 3 of Kwon shows that when the paper is stacked in a paper feed cassette (including 60 and 61), the first and second levers are normally forced out of the sensing area of the sensor (10)(e.g., the first and second levers are forced out of the sensing area of the sensor (10) when paper contacts the second lever as such paper is conveyed along path P, as best shown in Fig. 3 of Kwon).

Regarding claim 23, Fig. 4 of Kwon shows a front end of the second slot (61) in the paper pressing plate (60) to stop the third lever (20) from pivoting.

Regarding claim 24, the recitation "wherein, when the first lever enters the paper sensing area of the sensor, the sensor generates a signal that no paper remains in the paper feed cassette" is a conditional limitation that need not ever occur. Thus, it is the examiner's position that all of the limitations of claim 24 are met by Fig. 1 and numbered paragraphs [0003] – [0020] of the instant application in view of Kwon.

Regarding claim 25, column 4, lines 13-40 of Kwon disclose that the image forming machine receives the signal from the sensor (10), and compares a length of the signal with a standard length.

Regarding claim 26, as best understood, column 4, lines 13-40 and Fig. 5 of Kwon disclose that when the length of the signal is shorter than the standard length, the image forming machine judges that the paper is being fed along the printing paper path. Such device would be provided in the duplex printing path of Fig. 1 of the instant application and would function in the same manner.

Regarding claim 27, Fig. 5 of Kwon shows that when the length of the signal is longer than the standard length, the image forming machine judges that no paper remains in the paper feed cassette. In particular, any time the switch is determined to be off for either a long or short time period, the image forming machine judges that no paper remains in the paper feed cassette.

Regarding claim 28, the recitation "wherein, when the paper moves along the duplex printing paper path after being fed into the image forming machine, the paper

impacts the second lever, thereby causing the second lever to pivot into the sensing area of the sensor" is a conditional limitation that need not ever occur. Thus, it is the examiner's position that all of the limitations of claim 28 are met by Fig. 1 and numbered paragraphs [0003] – [0020] of the instant application in view of Kwon.

Regarding claim 29, the recitation, "wherein, when the impact between the paper and the second lever dissipates, the third lever causes the second lever to pivot out of the sensing area of the sensor" is a conditional limitation that need not ever occur. Thus, it is the examiner's position that all of the limitations of claim 29 are met by Fig. 1 and numbered paragraphs [0003] – [0020] of the instant application in view of Kwon.

Regarding claim 30, the recitation "wherein during the period when the second lever is inside the sensing area of the sensor; the sensor generates a signal that the paper is being fed along the duplex printing paper path" is a conditional limitation that need not ever occur. Thus, it is the examiner's position that all of the limitations of claim 30 are met by Fig. 1 and numbered paragraphs [0003] – [0020] of the instant application in view of Kwon.

Regarding claim 31, column 4, lines 13-40 of Kwon disclose that the image forming machine receives the signal from the sensor (10), and compares a length of the signal with a standard length.

Regarding claim 32, Fig. 5 of Kwon shows that when the length of the signal is longer than the standard length, the image forming machine judges that no paper remains in the paper feed cassette. In particular, any time the switch is determined to

be off for either a long or short time period, the image forming machine judges that no paper remains in the paper feed cassette.

Regarding claim 33, as best understood, column 4, lines 13-40 and Fig. 5 of Kwon disclose that when the length of the signal is shorter than the standard length, the image forming machine judges that the paper is being fed along the printing paper path. Such device would be provided in the duplex printing path of Fig. 1 of the instant application and would function in the same manner.

Regarding claim 34, the recitation "wherein, when a rear end of the paper being fed along the duplex printing paper path leaves the first slot of the duplex printing paper path, the second lever enters the slot in the duplex printing paper path" is a conditional limitation that need not ever occur. Thus, it is the examiner's position that all of the limitations of claim 34 are met by Fig. 1 and numbered paragraphs [0003] – [0020] of the instant application in view of Kwon.

Response to Arguments

6. Applicant's arguments with respect to claims 7-18, 20 and 23-35 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thomas A. Morrison whose telephone number is (571) 272-7221. The examiner can normally be reached on M-F, 8am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Mackey can be reached on (571) 272-6916. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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